

Appl. No. 09/660,162
 Atty. Docket No. 7886
 Amtd. dated May 27, 2003
 Reply to Office Action of February 24, 2003
 Customer No. 27752

AMENDMENTS TO THE CLAIMS

1. (presently amended) A process for preparing an ether-capped poly(oxyalkylated) alcohol having the formula:



wherein, R is selected from the group consisting of linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic or aromatic hydrocarbon radicals having from about 1 to about 30 carbon atoms; R¹ may be the same or different, and is independently selected from the group consisting of branched or linear C₂ to C₇ alkylene in any given molecule; x is a number from 1 to about 30; and R² is selected from the group consisting of:

(i) a 4 to 8 membered substituted, or unsubstituted heterocyclic ring containing from 1 to 3 hetero atoms; and

(ii) ~~linear or branched, saturated or unsaturated,~~ substituted or unsubstituted, ~~cyclic or acyclic, aliphatic or~~ partially unsaturated cyclic or aromatic hydrocarbon radicals having from about ~~14~~ to about 30 carbon atoms; and

(iii) 7 to 13 membered substituted, or unsubstituted polycyclic ring;

(iv) substituted or unsubstituted cyclic hydrocarbon radical having from 5 to 30 carbon atoms, wherein when the cyclic hydrocarbon radical is an unsubstituted 6 carbon radical or a substituted 7 or 8 carbon radical, R is a linear or branched, saturated or unsaturated, substituted or unsubstituted aliphatic radical having from about 1 to about 5 carbon atoms; and

(v) substituted or unsubstituted cyclic hydrocarbon radical having from 5 to 30 carbon atoms, wherein when the cyclic hydrocarbon radical is an unsubstituted cyclohexyl radical or a methyl or ethyl substituted cyclohexyl radical, R is a branched, saturated or unsaturated, substituted or unsubstituted aliphatic radical having from about 23 to about 30 carbon atoms;

~~provided that when R² is (ii) then either at least one of R¹ is other than C₂ to C₇ alkylene; or R² has from 6 to 30 carbon atoms;~~

comprising the steps of:

(a) providing a vinyl ether of the formula



wherein R² is as defined above;

(b) providing an alkoxyated alcohol of the formula

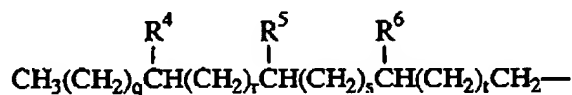
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wherein R, R¹, and x, are as defined above;

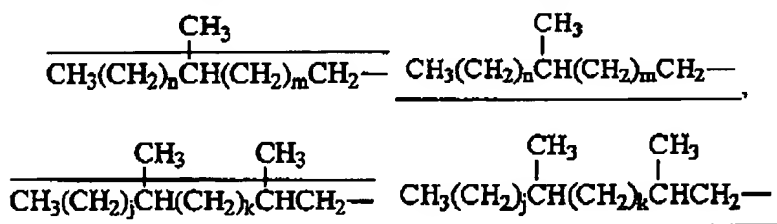
(c) reacting said vinyl ether with said alkoxyated alcohol in the presence of a catalyst to form said ether-capped poly(oxyalkylated) alcohol.

2. (original) The process as claimed in Claim 1 wherein R is a linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic hydrocarbon radical having from about 1 to about 20 carbon atoms.
3. (original) The process as claimed in Claim 2 wherein R is a linear or branched, saturated, aliphatic hydrocarbon radicals having from about 4 to about 18 carbon atoms.
4. (original) The process as claimed in Claim 1 wherein R has the formula:



wherein R⁴, R⁵, and R⁶ are each independently selected from hydrogen, C₁-C₃ alkyl, and mixtures thereof, provided that R⁴, R⁵, and R⁶ are not all hydrogen and, when t is 0, at least R⁴ or R⁵ is not hydrogen; q, r, s, t are each independently integers from 0 to 13.

5. (presently amended) The process as claimed in Claim 4 wherein R has the formula:



wherein n, m, j and k are each independently integers from 0 to 13.

6. (presently amended) The process as claimed in Claim 1 wherein R² is a hydrocarbon radical of the formula:



wherein R³ is selected from the group consisting of ~~linear or branched~~, saturated or unsaturated, substituted or unsubstituted, cyclic aliphatic radicals having from about 5 to

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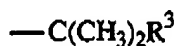
about 30 carbon atoms or substituted or unsubstituted aromatic hydrocarbon radicals having from about + 6 to about 30 carbon atoms.

7. (withdrawn) The process as claimed in Claim 6 wherein R^2 is CH_2CH_2 .

~~8. (withdrawn) The process as claimed in Claim 1 wherein R^2 is a 7 to 13 membered substituted, or unsubstituted polycyclic ring.~~

9. (presently amended) The process as claimed in Claim 8 1 wherein R^2 is selected from the group consisting of substituted, or unsubstituted adamantane, substituted, or unsubstituted norbornane, substituted, or unsubstituted nortricyclene, and substituted, or unsubstituted bicyclo[2.2.2]octane.

10. (presently amended) The process as claimed in Claim 1 wherein R is selected from the group consisting of linear or branched, aliphatic hydrocarbon radicals having from about 7 to about 11 carbon atoms; x is a number from 6 to about 10; and R^2 is selected from the group consisting of a hydrocarbon radical of the formula:



wherein R^3 is selected from the group consisting of ~~linear or branched~~, saturated or unsaturated, substituted or unsubstituted, cyclic aliphatic radicals having from about 5 to about 30 carbon atoms or substituted or unsubstituted aromatic hydrocarbon radicals having from about + 6 to about 30 carbon atoms.

11. (original) The process as claimed in Claim 1 wherein said catalyst is selected from the group consisting of mineral acids and Lewis acids.

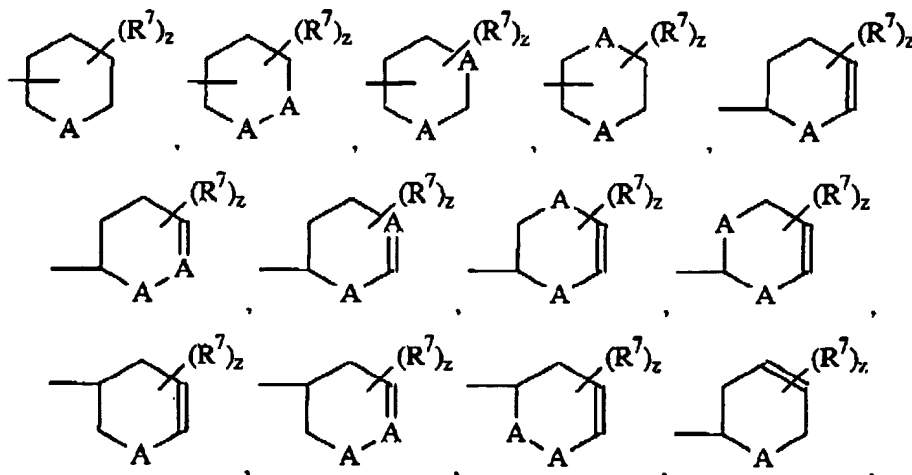
12. (presently amended) The process as claimed in Claim 1 wherein said catalyst is selected from the group consisting of $TiCl_2$, $Ti(O^iPr)_4$, $ZnCl_4$, $SnCl_4$, $AlCl_3$, $BF_3 \cdot OEt_2$, poly(4-vinylpyridinium p-toluenesulfonate), ~~DOWEX 50X8-50~~, H-Y Zeolite, ~~REILLEX 425~~, pyridinium p-toluenesulfonate, ~~AMBERLYST 15~~ p-toluenesulfonic acid, methanesulfonic acid and mixtures thereof.

13. (original) The process as claimed in Claim 1 wherein about 0.1 mol % to about 20.0 mol % of said catalyst is used in said step (c).

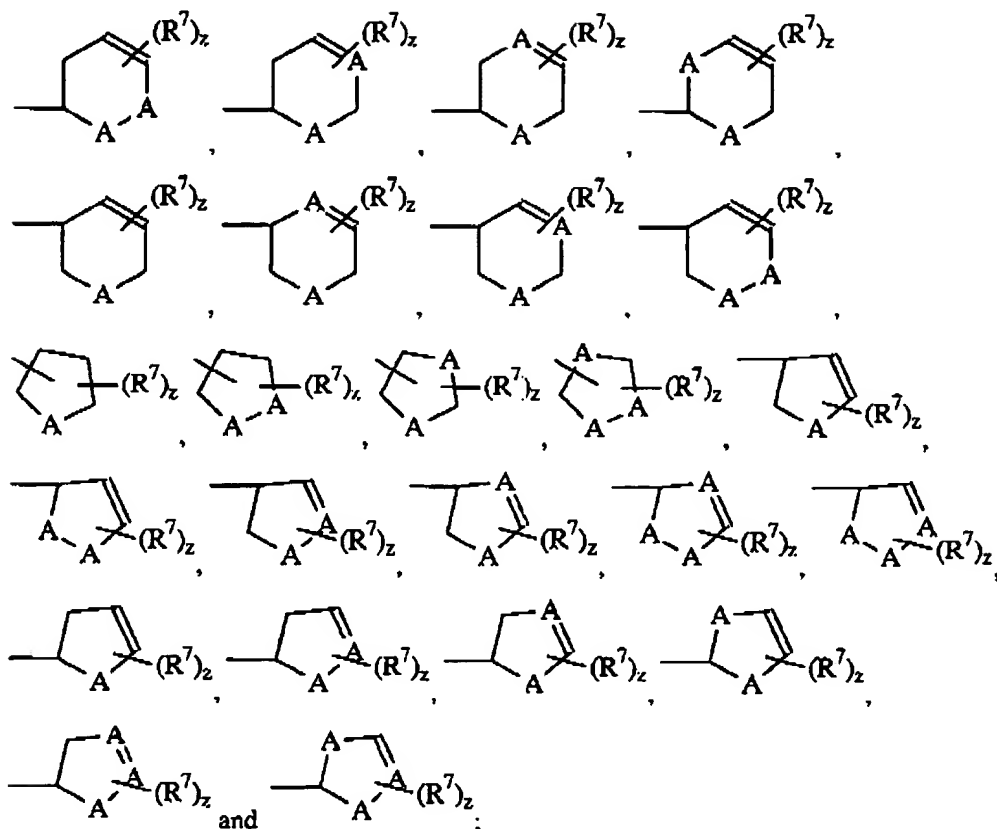
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14. (original) The process as claimed in Claim 1 wherein said step of reacting of alcohol with alkoxyated alcohol is conducted in the presence of a solvent.
15. (original) The process as claimed in Claim 14 wherein said solvent is selected from the group consisting of benzene, toluene, xylene, mesitylene, dichloromethane, tetrahydrofuran, diethylether, methyl tert-butylether, acetone, acetonitrile, and mixtures thereof.
16. (original) The process as claimed in Claim 1 wherein said step of reacting alcohol with alkoxyated alcohol is conducted as a temperature of from about -20°C to about 300°C.
17. (original) The process as claimed in Claim 1 wherein said step of reacting alcohol with alkoxyated alcohol is conducted in the absence of a solvent.
18. (original) The process as claimed in Claim 1 wherein R^2 is a 4 to 8 member substituted, or unsubstituted heterocyclic ring containing from 1 to 3 hetero atoms.
19. (original) The process as claimed in Claim 18 wherein said heterocycle is a 5 or 6 member heterocycle.

20. (presently amended) The process as claimed in Claim 18 wherein said heterocycle is selected from the group consisting of:

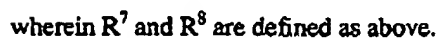


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wherein each R^7 is independently selected from the group consisting of hydrogen, linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic hydrocarbon or alkoxy radical having from about 1 to about 10 carbon atoms, or R^7 is a saturated or unsaturated, substituted or unsubstituted, alicyclic or aromatic hydrocarbon or alkoxy radical having, from about 1 to about 10 carbon atoms, which is fused to the heterocyclic ring; each A is independently selected from the group consisting of O, and $N(R^8)_a$, wherein R^8 is independently selected from the group consisting of hydrogen, linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic hydrocarbon radical having from about 1 to about 10 carbon atoms, and a is either 0 or 1; provided that any A that is bound by a double bond must be $N(R^8)_a$ wherein $a = 0$; z is an integer from 1 to 3.

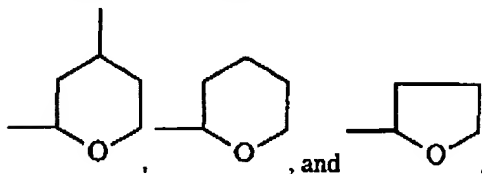
21. (original) The process as claimed in Claim 20 wherein said heterocycle is selected from the group consisting of:



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22. (original) The process as claimed in Claim 1 wherein said ether-capped poly(oxyalkylated) alcohol contains a chiral center.

23. (original) The process as claimed in Claim 20 wherein said heterocycle is selected from the group consisting of:



24. (presently amended) The process as claimed in Claim 1 wherein R^2 is a hydrocarbon of the formula:



wherein, y is an integer from 0 to 7; and X , is a 4 to 8 membered substituted, or unsubstituted, partially unsaturated cyclic or aromatic hydrocarbon radical.

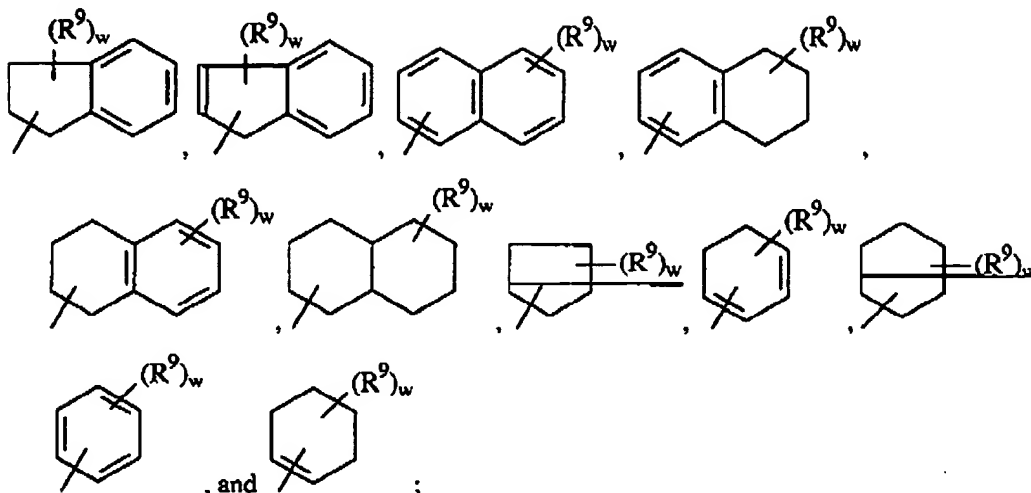
25. (presently amended) The process as claimed in Claim 24 wherein y is 0 from 1 to 7 and X , is a 5 or 6 membered substituted, or unsubstituted, saturated or unsaturated cyclic or aromatic hydrocarbon radical.

26. (presently amended) The process as claimed in Claim 1 wherein R^2 is a hydrocarbon of the formula:



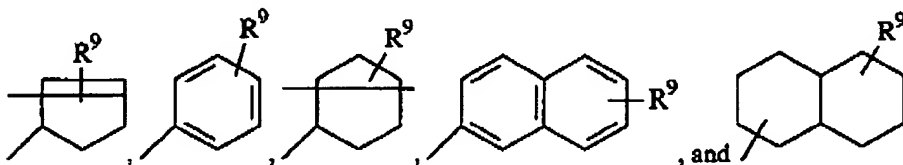
wherein, y is an integer from 0 to 7, and Claim 24 wherein X is selected from the group consisting of:

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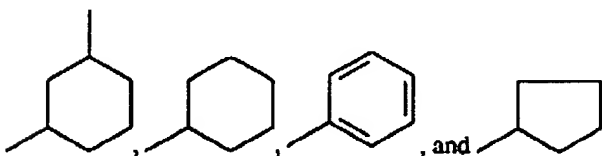
wherein each R^9 is independently selected from the group consisting of hydrogen, linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic hydrocarbon or alkoxy radical having from about 1 to about 10 carbon atoms, or R^9 is a saturated or unsaturated, substituted or unsubstituted, alicyclic or aromatic hydrocarbon radical having, from about 1 to about 10 carbon atoms, which is fused to the ring; w is an integer from 1 to 3.

27. (presently amended) The process as claimed in Claim 26 wherein X is selected from the group consisting of:



wherein R^9 is defined as above.

28. (presently amended) The process as claimed in Claim 26 25 wherein X is selected from the group consisting of:



29. (presently amended) The process as claimed in Claim 1 wherein R is selected from the group consisting of linear or branched, aliphatic hydrocarbon radicals having from about 7 to about

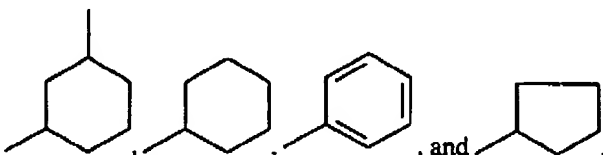
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11 carbon atoms; x is a number from 6 to about 10; and R^2 is selected from the group consisting of a hydrocarbon radical of the formula:



wherein y is 0 from 1 to 7 and X, is a 5 or 6 membered substituted, or unsubstituted, saturated or unsaturated cyclic or aromatic hydrocarbon radical.

30. (original) The process as claimed in Claim 29 wherein X is selected from the group consisting of:



31. (original) The process as claimed in Claim 1 wherein said process further comprises step (d) quenching the reaction of step (c) by the addition of a base.
32. (original) The process as claimed in Claim 31 wherein said base is selected from the group consisting of alkali metal carbonates, alkali metal hydroxides, alkali metal alcoholates, alkanolamines, alkyl amines, aromatic amines, and mixtures thereof.
33. (original) The process as claimed in Claim 32 wherein said base is selected from the group consisting of potassium carbonate, sodium carbonate, sodium methoxylate, sodium ethoxylate, potassium *tert*-butoxylate, triethylamine, triethanolamine and mixtures thereof.
34. (original) The process as claimed in Claim 32 wherein said base is an aqueous solution.
35. (original) The process as claimed in Claim 32 wherein said base is an aqueous solution selected from the group consisting of sodium carbonate, potassium carbonate and mixtures thereof and said aqueous solution is at a temperature of from about 20°C to about 60°C.
36. (original) The process as claimed in Claim 31 wherein the mixture produced by step (d) comprises at least 90% by weight of said ether-capped poly(oxyalkylated) alcohol.
37. (original) The process as claimed in Claim 1 wherein said process further comprises (e) removal of color bodies and odors from the product of step (c).

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38. (currently amended) The process as claimed in Claim 37 wherein ~~in~~ said step (e) removal of color bodies and odors from the product of step (c) is by contacting the product of step (c) with at least one reagent selected from the group consisting of an oxidant and a reductant.

39. (currently amended) The process as claimed in Claim 38 wherein ~~in~~ said oxidant is an hydrogen peroxide.

40. (currently amended) The process as claimed in Claim 38 wherein ~~in~~ said reductant is either sodium borohydride, or hydrogen over a palladium/carbon catalyst.

41. (original) The process as claimed in Claim 1 wherein said ether-capped poly(oxyalkylated) alcohol surfactant produced in said step (c) is removed from the product of step (c) by centrifuging.

~~42. (withdrawn) An ether-capped poly(oxyalkylated) alcohol surfactant produced by a process as claimed in Claim 1.~~

~~43. (withdrawn) A composition comprising an ether-capped poly(oxyalkylated) alcohol surfactant produced by a process as claimed in Claim 1.~~